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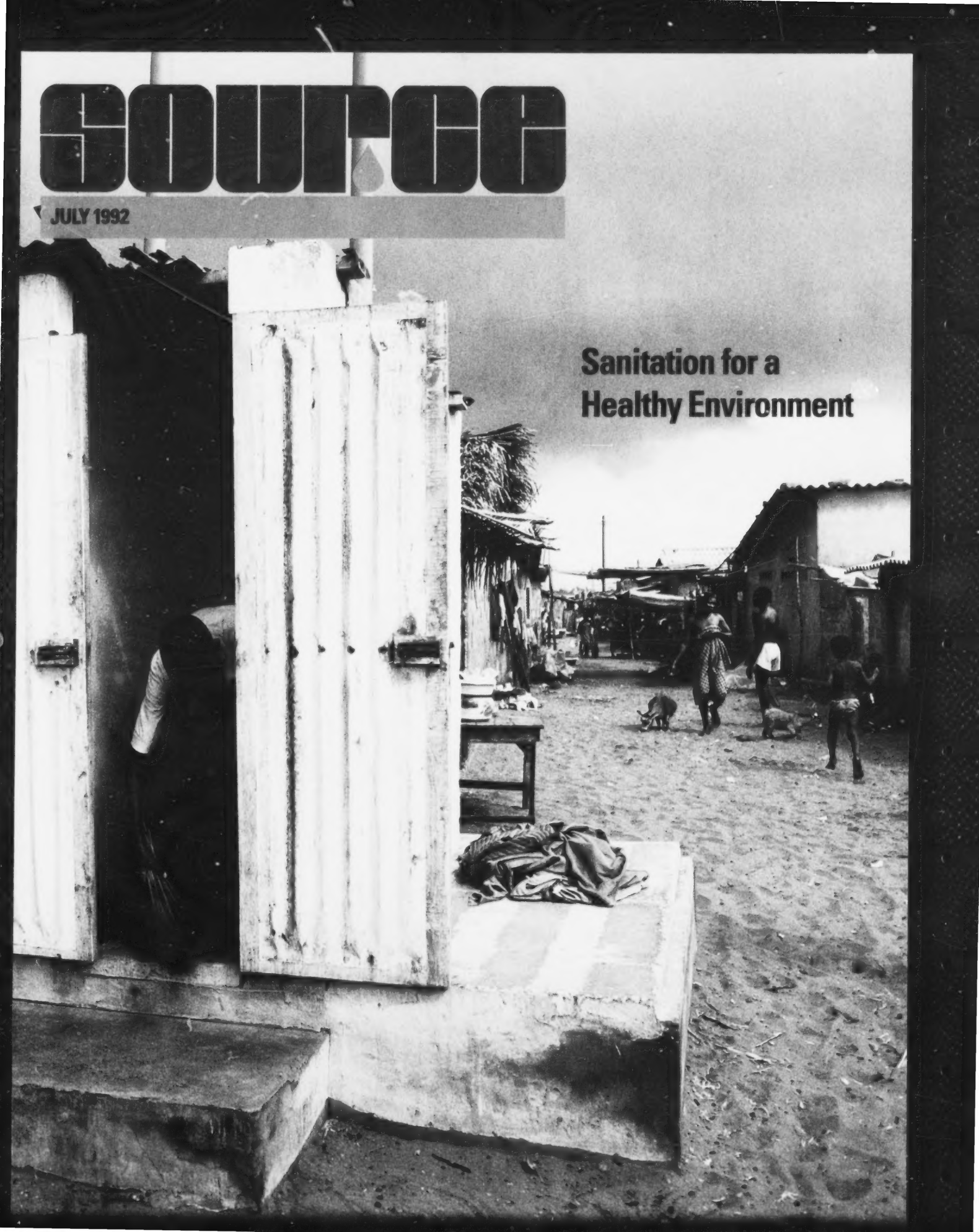
JULY 1992



Sanitation for a Healthy Environment

Renewed Support for *Source*

It is hoped our readers missed seeing the March 1992 issue of *Source*. It was never published. The UNDP project supporting production of the magazine over the past three years (and *Decade Watch* before that) came to an end in December 1991. It has taken a few months to mobilize renewed funding.

Fortunately, the magazine has developed a strong identity and base of support. We are pleased to report that a new partnership has now been forged to keep the magazine thriving over the next two years. UNDP's New York-based Division of Public Affairs (DPA) and Division for Global and Interregional Programmes have joined forces with the UNDP-World Bank Water and Sanitation Program in Washington to publish *Source* jointly. Production and distribution will continue to be based in UNDP/DPA New York.

Over the next two years we hope to broaden the scope of *Source*. The search is on for a wide range of contributing writers from developing countries—independent journalists as well as sector specialists and policy makers. We invite the members of the Water Supply and Sanitation Collaborative Council to contribute both editorially and financially.

Source will continue to focus on key water and sanitation issues. We will feature important lessons that are being learned in developing countries. And we hope to provide a sounding board for a spectrum of opinion about how to improve water and sanitation services for the poor.

Source will now be published in July and January. We want to hear from our readers about new developments, innovations and experiences. On behalf of our sponsoring partners, and the Collaborative Council, we sincerely invite you to contribute.

In this issue, we focus on sanitation, especially the Ventilated Improved Pit latrine. In many parts of the world and in many communities, it is proving to be affordable, aesthetically acceptable and appropriate. We also examine pricing. Increasingly people are realizing the importance of clean drinking water and adequate sanitation for their well-being: they are not only willing to mobilize to acquire these services, but are also ready to pay for them.—**The Editors**

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JULY 1992

Page 4: Sanitation improvements are under way in Kumasi, Ghana.

Page 10: UNV Elmer Rambacal is helping to build latrines in Botswana.

Cover: Throughout Africa communities are organizing to construct public latrines. Photo: Ruth Massey/UNDP.

2 **EDITORIAL** Renewed Support for *Source*

SANITATION FOR A HEALTHY ENVIRONMENT

4 Ghana: Kumasi's People Pay for Better Sanitation Services

10 Botswana: Mahalapye's Latrines Sink No More

14 Kenya: Bringing Village People into Planning

19 Bangladesh: Matching Technologies to People's Needs and Means

24 **GUEST ARTICLE** Collaboration: The Wave of the Future

26 **DONOR PROFILE** SIDA

28 **NEWS** Dublin Conference Agrees on Water as an Economic Good

Fund to Promote Innovative Low-Cost Technologies

PROWWESS Relocates

30 **RESOURCES**

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KUMASI'S PEOPLE PAY FOR BETTER SANITATION SERVICES

BY DAVID KINLEY

Kumasi, Ghana—Francis Okyere Darko is an unemployed factory worker living in a low-income residential community on the outskirts of this sprawling, dusty city of 700,000, Ghana's second largest. But temporary economic hardship hasn't discouraged him from dealing with a pressing problem on the homefront.

The Darko family occupies one room of a large single-story rectangular compound that houses 11 other tenants. Until last year, the nearly 50 residents depended on one simple "pan" latrine in the corner of the courtyard that required frequent emptying by conservancy workers paid by the city.

"When the attendants were laid off, the latrine became useless," explains Mr. Darko. "We were all forced to use the public latrines near the market, or simply relieve ourselves in the bush. The public toilets were filthy and unhealthy, and we

Photo by David Kenley - World Bank

Sanitation improvements are under way in Moshi Zongo, one of the poorest parts of Kumasi.

had to stand in line and pay each time." An estimated 8,000 people living in the Ayigya Zongo area of Kumasi were relying on the same overused and badly maintained public facilities.

Ahmed Iddrisuh, a local member of the Committee for the Defense of the Revolution, had an option to offer Mr. Darko and his neighbours — the Kumasi Ventilated Improved Pit (KVIP) latrine. For a down payment of about US$55 and a $10 monthly installment, the tenants now have a clean, odour-free, low-maintenance sanitary disposal facility in their compound. A two-year loan to finance the system came from a revolving fund managed by a community sanitation committee. Latrine construction was carried out by a local private contractor.

With support from locally formed sanitation committees, 23 households in Ayigya Zongo have built new KVIPs during the past year. Moreover, in three economically diverse communities around Kumasi, hundreds of new and improved home latrines are now in regular use or under construction. The effort is part of a city-wide initiative to meet the growing demand for better sanitation services through a variety of low-cost, market-oriented solutions.

"Kumasi's city government simply doesn't have the capacity to provide sanitation services directly to the population," says Ato Brown, director of the Kumasi Sanitation Project, a $1.1 million initiative funded by the United Nations Development Programme (UNDP) and executed by the World Bank. "We're trying to help re-organize municipal institutions so they can better facilitate service provision through the private sector."

Roughly three quarters of Kumasi's population does not have adequate sanitation facilities: 40 per

Together with his co-tenants, Francis Darko is paying for improved household sanitation.

Photos by David Kinley / World Bank

cent rely on overused public latrines, another 25 per cent use unhygienic pan latrines, five per cent use traditional pit latrines, and about five per cent defecate in the open. Moreover, as much as 90 per cent of the waste removed from public and domestic pan latrines was being improperly disposed of in nearby streams, drains and vacant lots within the city.

Nowhere is the human waste problem more acute than in the Moshi Zongo subdistrict, where 6,000 to 8,000 people—most of them immigrants from Mali and Burkina Faso—crowd a denuded and eroded area on the outer fringes of Kumasi. Some of the rented multi-family dwellings have water connections, but most people buy water from neighbours with yard taps. Few have adequate sanitation facilities. The poorest children use the local waste dump for their latrine. And gullies filled with grey wastewater and household garbage run down the alleyways between the tightly clustered homes. Waterborne diseases are rampant.

Chamago Touré, a poor shopowner and trader from Mali, decided to invest a substantial amount of his savings and monthly earnings in an improved household KVIP latrine. "Our old latrine was illegal, unsafe and unhealthy," says Mr. Touré. "I

Top: New VIP latrines are being built to serve Kumasi's downtown.
Bottom: Some people in Kumasi's poor neighbourhoods still rely on open wells.

excavated the pit for the KVIP myself. Then with a loan from our sanitation committee, I paid a contractor to complete the construction. Now I'm collecting the monthly fees from each of the families in my compound." It will take about two years for Mr. Touré's 10-family compound to pay off the investment completely. Yet despite the financial burden, dozens of households throughout Moshi Zongo are emulating the sanitation improvements.

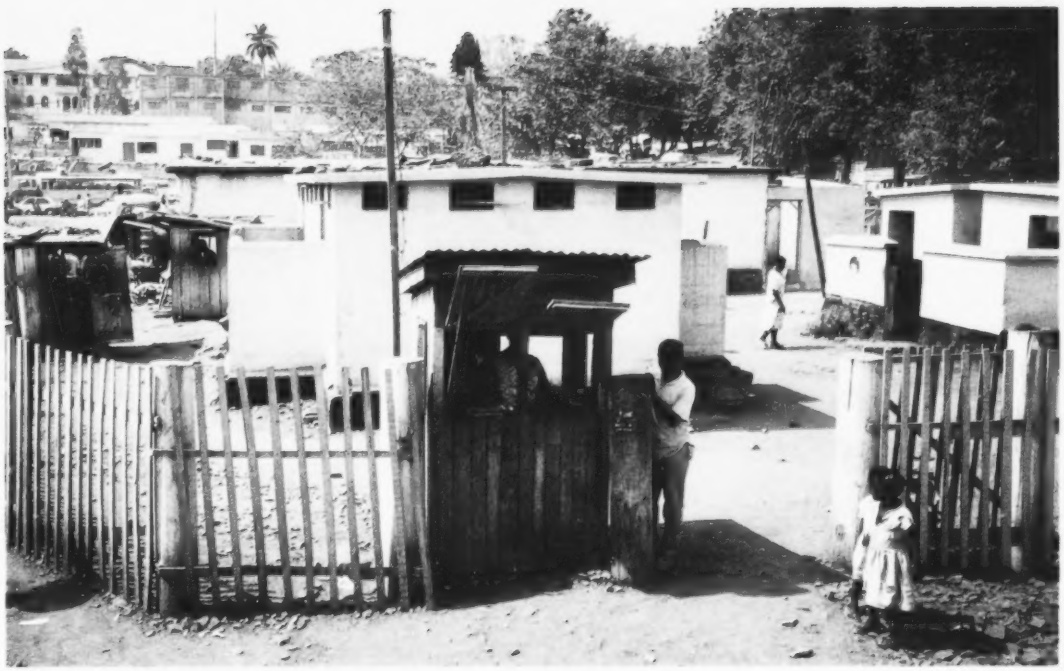
Rapid population growth and a virtual collapse of city-run waste management services led to a crisis situation in the 1980s, according to Mr. Brown. "Septic tanks were overflowing, drainage systems were blocked, public latrines were left to deteriorate, city waste removal equipment was non-functioning, and mountains of garbage and human waste had accumulated all around the city," he explains.

Initial efforts to deal withKumasi's mounting sanitation problem began in 1986 when Head of State Jerry Rawlings visited the city to initiate a mass voluntary garbage evacuation campaign. The larger institutional problems began to be tackled with the Kumasi Sanitation Project in 1989.

"Four sanitation master plans had been produced for Kumasi since 1951, but none had progressed through even the first stage of implementation," says Albert Wright of the World Bank's Water and Sanitation Division in Washington, DC. "After 40 years of traditional master planning based largely on a single high-cost technology, the city still had no comprehensive sewerage system and most of the city remained unserved. A major re-thinking was in order."

The first step was to elicit the needs and preferences of people in various communities in Kumasi. A "willingness-to-pay" survey was conducted among more than 2,000 representative residents to determine their preferences for various sanitation technologies and their financial resources to support new systems. Three findings were most revealing: families on average were willing to pay about the same amount for sanitation ($1.60 per month) as they paid for rent, electricity or water; the

Kumasi's bustling marketplace is one of the largest in West Africa.



Over 40 per cent of Kumasi's population relies on public latrines.

Photos by David Kniley - World Bank

poorest people who used public latrines were spending more for sanitation than those with household systems; and the poor would be willing to pay even more for improvements in their homes.

A multi-disciplinary team of specialists from the Ministry of Health, Department of Community Development, Kumasi Metropolitan Authority and UNDP-World Bank project then began work on a home latrine programme to test whether people in three varying neighbourhoods would be willing to invest their own money in new or improved facilities.

"The response to our outreach campaign has been extremely encouraging," says Anthony Mensah, facilitator of the home latrine building programme. "In the three pilot areas a total of 155 new or improved units have been constructed through the revolving loan schemes serving almost 4,000 users with better, safer household facilities."

Major rethinking was also called for in the management of Kumasi's public latrines, which were suffering from years of maintenance neglect. An experiment was launched in 1990 to determine whether private companies could do a better job of running them than the city administration. Twelve latrine sites serving more than 20,000 people daily were selected for franchised management. Five private contractors took charge, paying the city 15 per cent of their total revenues.

"The conditions of these public latrines were deplorable when we took them over," says Albert Joseph, a local entrepreneur whose small company now manages a sanitary complex used by almost 5,000 people a day. "Now the tanks are emptied twice a week and insecticides are applied regularly to control disease. Our customers are much happier and the city is making money where it used to lose it."

Albert Joseph (second from right) runs a private company that manages several public sanitation complexes.

Mr. Joseph's company won the bidding against four other firms to manage three latrine complexes and already has 28 full-time employees, including several former city workers. He has recouped most of his investment in a suction truck and is planning to invest in equipment for collecting refuse house to house.

The success of the home and public latrine pilot projects has led to development of a larger "Strategic Sanitation Plan" for Kumasi for the 1990s. Under the leadership of the Kumasi Metropolitan Authority and with support from UNDP and the World Bank, the scheme aims to provide the entire population of the city with improved sanitation services by the end of the decade. Unlike previous plans, the new approach will employ a range of technological solutions—from conventional and simplified sewerage to KVIP latrines—to address various economic and demographic conditions.

"By the end of the century, at least one quarter of the city will have to be sewered to deal with the heavy population density," says Mr. Brown. "Household solutions are what most people want, so we're planning to reduce use of public latrines to just 10 per cent of the population. In the next eight years we hope to have 350,000 people using KVIP latrines that they have paid for largely themselves."

Successful adoption of the new technologies will take strong political leadership. "Many metropolitan assembly-men want to see flush toilets installed in their communities," says Kumasi Metropolitan Secretary Captain A.Y. Mensah. "But the KVIP must be considered as the most appropriate and affordable technology for much of the city."

Ghana has been taking bold steps to reform its economy and change the role of government from that of provider to promoter of basic services. Communities throughout Kumasi are demonstrating that better sanitation is a priority for which they will pay. With its new market-oriented approach, the city is prepared to help them install facilities. ■

MAHALAPYE'S LATRINES

BY I. RAJESWARY

Mahalapye, Botswana—Residents of this sprawling village who could afford to build traditional pit latrines in their compounds once felt very proud. In Mahalapye, almost 170 kilometres north of the capital city of Gaborone, it spelled prestige. But many were bewildered when their spanking new structures collapsed after a short while, especially during the five-month rainy season.

"The sinking toilets of Mahalapye were a common sight," recalls Elmer Rambacal, a United Nations Volunteer (UNV) specialist from the Philippines who is working in Botswana. "Once it sank, a latrine was abandoned since it could not be used any longer."

To build such a traditional latrine, a villager simply dug a pit and covered it with slabs of timber on which the user would squat. A wooden structure was then erected over the latrine for privacy. But as the pit was not lined, nearby water sources were exposed to contamination. And over time, termites attacked the wood and weakened the structure, causing it to fall apart.

Two years ago, Mr. Rambacal and his partner, Samuel Leimela, a senior health assistant with Botswana's Ministry of Health, started teaching villagers how to build Ventilated Improved Pit (VIP) latrines. Since

then, latrines in Mahalapye have not been collapsing. In fact, people from neighbouring towns, having heard of the sturdy new structures, are asking Mr. Rambacal and Mr. Leimela to help them build similar ones in their back yards.

The partners are also giving health education to men, women and school children in Mahalapye, explaining the link between poor sanitation and the spread of excreta-related diseases, and the importance of personal hygiene. Fulfilling similar duties in their respective duty stations are UNVs Joseph Bockarie, a Sierra Leonean based in Palapye, 75 kilometres north of Mahalapye, and Chellappah Velaiyutham, a Sri

SINK NO MORE

J. Ratcway - UNDP

UNV Elmer Rambacal helps residents of Mahalapye build latrines.

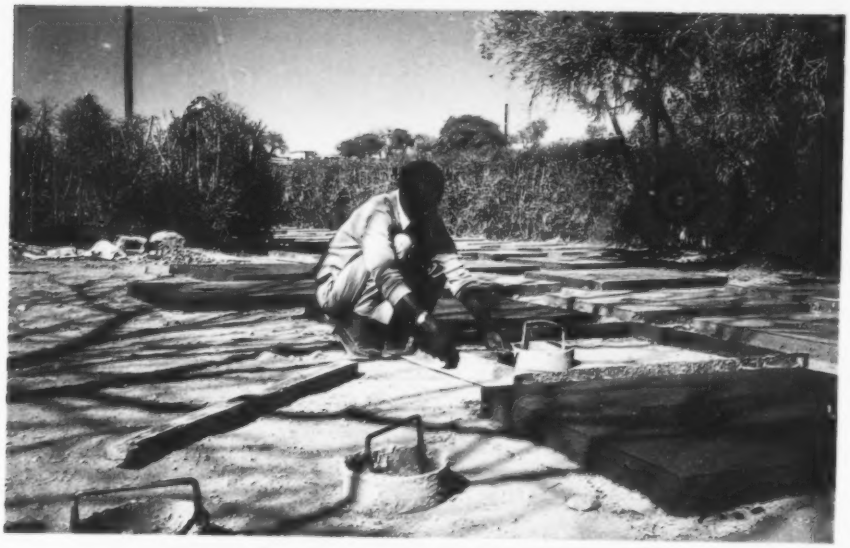
Lankan stationed in Serowe, 44 kilometres west of Palapye.

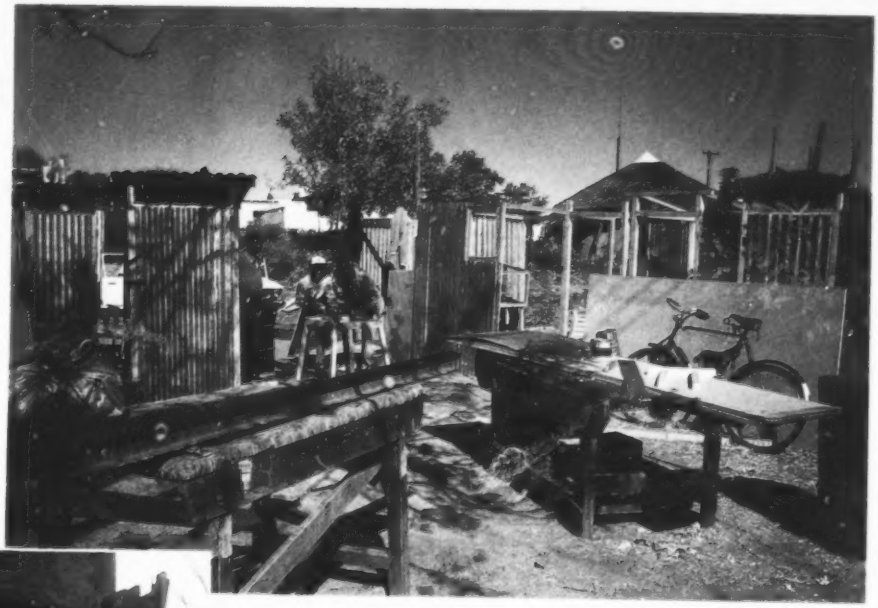
In Botswana, diarrhoea is one of the leading causes of death among children, killing about four each day. The high number of cases is due to the consumption of contaminated water, poor personal and environmental hygiene, and inadequate human waste disposal facilities.

Concerned over the welfare of its people, the Government of Botswana devised strategies to assist families in preventing and treating diarrhoea, as well as alleviating the incidence of other diseases. One such plan was a National Rural Sanitation Programme to upgrade major village water supply and provide households better access to sanitary excreta disposal.

Four villages — Mahalapye, Palapye, Serowe and Tonota — were selected for a pilot sanitation project funded by the government and the German Development Bank (KFW), with technical support from the United Nations Development Programme (UNDP). A key element of the project, costing over US$600,000, was the construction of nearly 3,000 VIP latrines — but only through community participation.

The insistence on community involvement was overdue. A vast country about the size of Spain but with a small population of just over 1.2 million, Botswana has one of the strongest economies in sub-Saharan Africa due to large deposits of diamonds and other minerals. However, the dearth of economic opportunities, infrastructure and social services at Botswana's independence in 1966, combined with the rapid economic growth over the past 25 years, resulted in the government adopting a top-down approach in the administration of development programmes. As a result, people became passive recipients of government assistance and not initiators of their





Communities are being mobilized to construct several thousand improved latrines in rural Botswana.

own development. This was accompanied by a reduction in voluntarism and self-reliance.

To reverse this trend, in 1989 the government began creating programmes to stimulate people's active involvement in self-help schemes. The sanitation project, one such action plan, required local people to build VIP latrines for themselves.

To participate, each household had to pay a registration fee of $15, excavate the pit according to the specified dimensions, and construct the superstructure. The owner was also required to attend workshops to learn how to maintain the pit. In cases where the soil was rocky, the government, through local district councils, provided a compressor to excavate the pit. It also supplied bricks for lining the pits, concrete floor slabs, seat liners and ventpipes with fly screens.

Because Botswana has a shortage of skilled workers, three UNVs were recruited to coordinate and implement the project. Each UNV had a national colleague to work with and train so that the local people would become self-reliant and able to continue building latrines after the UNVs had left.

Health education is considered crucial for sustained use of the new facilities because the government does not want the latrines to end up as storerooms while people defecate in the bush as had previously been the case. It was also anxious for village folk to toilet-train their children. "In the past, one or two young children fell into the pits of traditional latrines and died," says Mr. Velaiyutham. "Therefore, parents prevented children from using pit latrines. We have to allay their

fears and educate them."

To promote VIP latrines, demonstration toilets are built in the poorest villages of Botswana. UNVs and their national partners explain how the latrines are built at village meetings, after which community members are taken to see the demonstration models. "Once the people see the latrines," says UNV Mr. Bockarie, "the idea is sold and there is a surge in registration." To further promote latrines and enhance health education, Mr. Bockarie organized poster and song writing competitions, which attracted primary and secondary school students. The winning posters were displayed in community halls.

While it has been relatively easy to publicize VIP latrines, it has not been easy to change people's behaviour. In Mahalapye, Mr. Leimela and Mr. Rambacal sometimes preach personal hygiene to patients waiting at clinics. "We have no choice but to keep talking to them," says Mr. Leimela.

In Serowe, Mr. Velaiyutham mobilizes community health workers to spread the word since they are in direct contact with the local population. "The health workers explain the importance of proper sanitation and personal hygiene on their home visits," he says.

The multi-pronged approach to creating awareness about health and sanitation among local communities is bearing fruit. More and more villagers are enrolling in the latrine-building programme. Also, as villages expand and there is less bush area for people to use for defecation, a VIP latrine becomes a necessity.

A collapsed traditional pit latrine.

These days, new houses in Botswana are being designed with a VIP latrine in the compound—not as an afterthought. In many instances, owners only want to move in after the latrine is completed.

To date, over 1,800 VIP latrines have been built in the four villages. Mr. Velaiyutham, working with local contractors, has designed galvanized superstructures, which are cheaper than the concrete ones. He continues to conduct workshops and has compiled a training manual. Mr. Bockarie has prepared health handbooks and enlists school children to help promote personal hygiene.

Mr. Rambacal communicates with nurses and health workers who in turn advise their patients on the benefits of VIP latrines. "The sinking toilets of Mahalapye" have now become a thing of the past. ■

BRINGING VILLAGE PEOPLE INTO PLANNING

BY DAVID KINLEY

Maina, Kenya—More than 13,000 low-income Kenyans are crowded into crude wooden houses in a hillside village near Nyahururu, a fast-growing town in western Kenya's Rift Valley Province. The village was originally established as a refuge for displaced "freedom fighters" after the country's independence struggle with the United Kingdom. Its population burgeoned in the 1980s when squatter families were evicted from the nearby national forest. Eight to 10 people now typically live in each small rented room.

After the influx, Maina's physical infrastructure deteriorated. Dirt roads and footpaths became dusty and littered in the dry season, and impassable during the wet season. Open ditches carried washwater, garbage and human excreta. Most people in Maina relied on crude and unsanitary pit latrines for excreta waste disposal. There was no electricity. The one luxury was a piped water system that served many—but not all—of the homes.

"Health and sanitary conditions in Maina were very bad," recalls Raphael Karimi Githendu, the chief of Nyahururu municipality. "Toilets were overflowing. There was worm infestation, and diarrhoeal disease. Wastewater was all over. Each household plot was a lake breeding mosquitoes."

All this was supposed to change in 1986 when Nyahururu's Municipal Council and the Danish International Development Agency (DANIDA), joined forces in a programme to im-

Photos by David Kinley - World Bank

A network of sewers now serves many residents of Maina.

Children in Maina's primary schools now use improved latrines.

prove sanitation services in four mid-sized Kenyan towns. While Nyahururu's waterborne sewerage system was extended to town residents, Maina was targeted to receive new storm drains, a sewerage network, a latrine for each household plot and upgraded roads.

Nothing went according to plan. "DANIDA had a lot of valuable experience building sewerage systems in other towns in Kenya," says Gunnar Schultzberg, an engineer with the UNDP-World Bank Water and Sanitation Program in Nairobi. "Unfortunately, at first, the work in Maina was seen as a simple engineering job. The village people were not brought into the process."

Town engineers and local contractors went to work installing the trunk sewer line into Maina, and connecting service lines in one part of the village. They also built four demonstration improved pour-flush latrines. But when a DANIDA team including Mr. Schultzberg arrived in early 1989 to review the progress in Maina, it found an unused sewerage network and four idle latrines demonstrating nothing. Indeed, local project officials were confronted with a hostile community that was

refusing to cooperate with any of the planned activities. Frustrated DANIDA officials considered cancelling the project.

"The initial efforts to introduce new sanitation and drainage facilities were viewed with suspicion by most of the residents," explains Paul Waikwa, a young Kenyan engineer working with DANIDA. "Most people in Maina are poor tenants and many thought that improvements in their neighbourhoods would mean higher rents or evictions. Others simply didn't understand the value of better sanitation."

Instead of cancelling the project, DANIDA officials decided to engage a community development organiza-

Sanitation and drainage remain problems in low-lying parts of Maina.

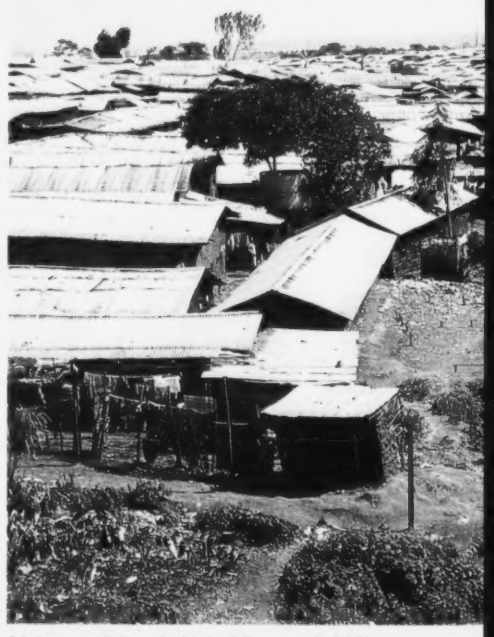
KWAHO's Urban Challenge

Nairobi, Kenya—Cities across the African continent are growing at unprecedented rates, and most of the growth is haphazard. Kibera, the largest unplanned settlement in Nairobi, has a population of over 400,000 crowded onto just 110 hectares of high-density rental housing. Twenty years ago the population was less than 20,000.

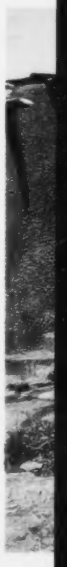
Uncertainty is a key facet of life for the poor in Kibera, many of whom are low-wage seasonal and day labourers in the Nairobi Industrial Area. Because tenure over land is not legally secure, landlords build cheap rental housing units and expect to recoup their investment in one year. The threat of demolition is always present. Piped water is in short supply throughout Kibera. When it is available, the poor often pay five to 10 times the price paid by middle class households. Even though Kibera lies on a sewer line, due to its illegal status, no connections are permitted. Crude pit latrines serve as the primary means of excreta disposal.

There are few economic incentives for landlords to improve the basic infrastructure and living conditions in Kibera. But now a coalition of over a dozen Kenyan NGOs is involving poor residents in Kibera and other rapidly expanding informal settlements in community self-improvement actions. The Kenya Water for Health Organization (KWAHO) has taken the lead in addressing water and sanitation problems.

Under the leadership of Executive Director Margaret Mwangola, KWAHO has had notable success in eliciting community participation, especially that of women, for improving rural services in Kenya. Now it is applying some of its mobilization techniques in Kibera. For example, KWAHO has assisted women's groups in constructing fourteen 4,000-gallon water storage tanks, getting them connected to the

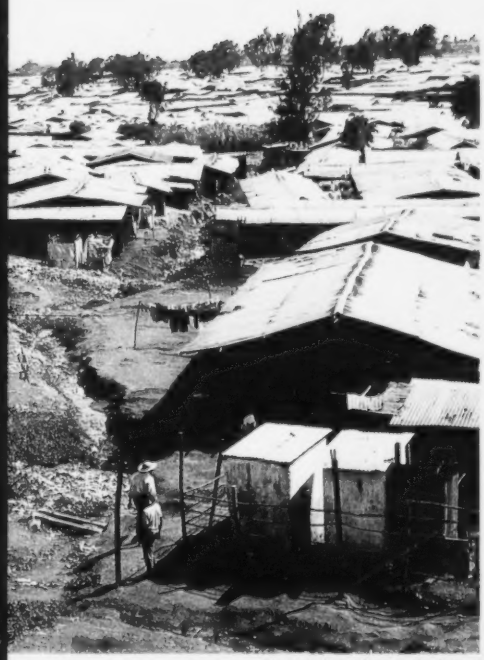


Living conditions in Nairobi's crowded Kibera settlement are very unhealthy.

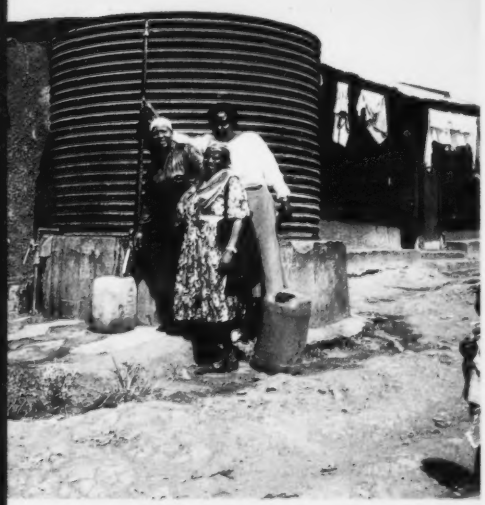


city water supply, and setting up water kiosks through which they manage water sales in the community. Besides increasing access to water, this has lowered prices to consumers by almost 50 per cent. Some of the money earned from water sales is reinvested in a charcoal distribution scheme, reducing fuel prices for poor residents as well.

Kibera residents have also received KWAHO's assistance in constructing Ventilated Improved Pit (VIP) latrines, and in establishing a latrine emptying service that extends limited services to all nine sections of Kibera. The special suction truck, provided with support from the Norwegian Agency for Development, can negotiate the narrow and difficult pathways winding through the community and remove the dense sludge from pit latrines. The vehicle is managed by a 13-member community management team and operated by a crew of three. During the first half of 1991, over 6,000 households paid the US$9 advance fee to have their home latrines emptied.



Photos by David Kinley / World Bank



KWAHO has donated water storage tanks and organized women's groups as vendors.

Manus Coffey

KWAHO's suction truck, designed by Manus Coffey Associates, can negotiate narrow pathways.

"Working to organize poor urban communities for improved water and sanitation is much more difficult than mobilizing people in the rural areas," says Margaret Kitiku, a community health worker managing KWAHO's small office in Kibera. "Everyone living here is illegal and neighbours are not tightly knit together like they are in the villages."

Today, roughly half of Nairobi's population of two million resides in informal settlements. By the year 2000, it is estimated that up to 60 per cent of the city's projected four million residents will live under similar overcrowded conditions. KWAHO's work in Kibera shows that people in such areas are willing — when given the opportunity — to create a healthier environment. **—D.K.**

tion to help build popular support for implementing sanitation improvements. In the early months of 1989, the Nairobi-based Kenya Water for Health Organization (KWAHO) was handed responsibility for educating and mobilizing Maina's population. Two KWAHO professionals were hired, one to work full time in the community.

"Before any new construction activities began, we spent several months in dialogue with the village health committee, women's groups, landlords, and local officials," says Jamleck Gitonga, KWAHO's community extension officer in Maina. "Discussions about the benefits of better sanitation led to village-wide 'clean-up' days and extension of basic health messages."

Twenty solid waste collection points were established and concrete containers installed. Various religious, ethnic, and secular community groups, comprised largely of women, were encouraged to form an umbrella organization, Kihato (the Broom), which helped organize clean up days and educated villagers on the need for a cleaner environment. Sixteen people from Maina were taken to observe a similar DANIDA-supported sanitation project in Homa Bay, western Kenya. And KWAHO facilitated the creation of a "site committee" — made up of local village leaders, landlords, tenants, and government officials — directly linking community members and the project implementation team. This committee was responsible for overseeing construction of sanitary units, drainage facili-

David Kelley / World Bank

Waste disposal bins have helped to improve environmental sanitation in Maina.

ties, and refuse disposal services.

"Once people were convinced that the improvements were intended to benefit them, they were eager to cooperate," says Paul Waikwa. "By strengthening the village-based organizations, KWAHO helped develop a sense of local ownership of project activities, and a willingness to contribute."

Construction activities started up again in late 1989 with a new sense of purpose. Eighty-five landlords signed an agreement developed by KWAHO and local authorities pledged their financial commitment to the project— US$56 for each new household latrine connected to the sewer system. Plot owners voluntarily began pulling down parts of existing structures to make way for the new residential units, drainage systems and better roads. Residents of Maina began contributing cement, timber, nails and iron sheets for structures to house new pour-flush latrines. Within an 18-month period, 112 residential sanitation units serving six to 10 households each had been constructed and connected to the sewerage system. Due to growing community interest, the number of planned connections jumped from the original 300 to 369. And improved pour-flush latrines were built in the primary school. With the full involvement of community organizations, work commenced on road compacting and digging of storm-water drains.

"In the past year we have made many improvements in our health and the surrounding environment," says Esther Mwangi, chairperson of the Kihato group that now mobilizes 300 people twice a month for village cleaning. "Better awareness about the importance of sanitation and the new household latrines has reduced the level of sickness, especially diarrhoea and skin disease."

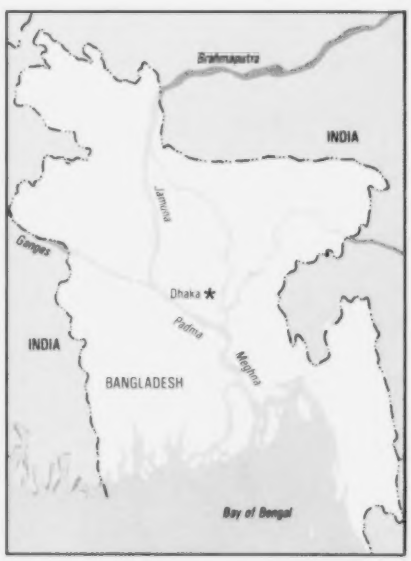
Community mobilization has led to other village-level initiatives including formation of "Mugi," a self-help committee developing new income-generating activities. One group organized to operate a donated maize-grinding machine, the first in Maina. The Kihato group is developing plans to purchase a refrigerator to stock medicines in their small dispensary. Still others are beginning to generate support for bringing electricity to Maina.

"We are extremely pleased with the process that has been introduced into Maina village by KWAHO," says Lawrence Wandao, district health officer for Nyahururu. "People here are ready to participate in the spirit of harambee—to contribute as a group and share in the cost. It was just a matter of tapping into that spirit."

For officials working with DANIDA, the experience in Maina provided some important lessons. "The mobilization work carried out by KWAHO—the dialogue among the Town Council, the project, tenants and landlords that was initiated—allowed them to reach the physical targets and to develop firm structures crucial to the sustainability of the new facilities," says DANIDA's Nairobi-based Counsellor, Erik Mortensen.

There was also a lesson for Nyahururu's city authorities. "Local officials often don't have the time to spend on site, listening to the ideas of people and explaining the planned benefits," says Christopher Waregua, water and sewerage superintendent. "It took dedicated efforts at the grass roots to change the attitudes in Maina's poor neighbourhoods and build genuine commitment to community development." ■

MATCHING TECHNOLOGIES TO PEOPLE'S NEEDS AND MEANS



BY DAVID KINLEY

Mirzapur, Bangladesh—For nearly a decade, foreign development specialists descended upon this tranquil, palm-shaded farming village of 5,000 people, clustered on one side of the highway 60 kilometres north of Dhaka. Mirzapur's dire poverty, poor health and proximity to the capital made it a logical choice for testing experimental water and sanitation technologies, and for studying their impacts on disease. Throughout the 1980s, villagers in Mirzapur cooperated with engineers and social scientists. Over time, the village gained a reputation as a development showcase for visitors from far and wide.

Today, the roadside project office is closed, and only a few concrete latrine slabs disintegrating near the roadway attest to the former concentration of activity. Village life has returned to normal. And the inevitable questions lurk. What was left behind when the experts went away?

Fortunately, there have been substantial improvements in water supply and sanitation services in Mirzapur—progress that appears to be sustainable. "Our handpump was installed more than six years ago and still serves 50 people with safe drinking water," says Minu Rani Das, a poor mother of four and leader of a local handpump maintenance group. "Whenever the pump fails, we know how to repair it, or where to go for help. We never drink contaminated water anymore."

Neither is Ms. Das exceptional. Neighbouring villagers confirm that regular use of handpump water for cooking and washing is the norm.

More than eight years after a group of international aid agencies and a local research institute began testing low-cost handpumps and latrines here, health and environmental conditions have markedly improved. Household compounds are swept clean of litter. Improved fam-

Mirzapur's women have become skilled pump caretakers.

ily latrines are in good working order. Diarrhoeal and skin diseases have been substantially reduced, and cholera virtually eliminated. At any given time, 96 per cent of the heavily-used Tara handpumps are operational and well maintained, in large part by village women with basic repair skills like Ms. Das.

Mirzapur exemplifies the water and sanitation challenges that the Bangladesh government and external and local support agencies are trying to address nationwide. With over 110 million people spread across 143,998 square kilometres, Bangladesh has one of the highest population densities in the world—700 people per square kilometre. Four months each year the country is inundated with flood waters, and pathogens spread widely and quickly, causing enormous health risks. More than 250,000 children die annually from diarrhoeal diseases alone, according to the Health Ministry. The vast majority of the rural population is illiterate, surviving on an annual per capita income of less than US$200. Malnutrition affects up to 80 per cent of the infants and children in the country.

Introducing better water and sanitation facilities, and maintaining those improvements under such conditions is no easy task. "We carried out an intensive educational campaign to help build community-managed services in Mirzapur," says Zia us-Sabur of the NGO Forum, a consortium of private development agencies working to improve rural water and sanitation. "Gaining community acceptance and support for the new technologies required a series of motivational efforts in the villages over several years."

Finding technologies that match peoples' needs and means is equally important to success. "For new technologies to be adopted and effectively used in Bangladesh, they must be readily accessible, very cheap, and very easy to maintain," says Haroon ur-Rashid, manager of the UNDP-World Bank Water and Sani-

Grameen Bank: Sanitation Loans for the Poor

Dhaka, Bangladesh—The Grameen Bank has gained international acclaim for its novel approach to economic development and poverty reduction in Bangladesh—making small loans at commercial rates to groups of poor people in rural areas. Today, it has nearly one million borrowing members in over 24,000 villages, more than 90 per cent of whom are women from families that are landless and without assets. Operating through 910 branch offices, Grameen lends almost $10 million each month for a wide range of village-level activities, from fish vending to rice-growing.

Each individual who receives a loan must agree to the Bank's "Sixteen Principles," including pledges to cultivate vegetables, drink tubewell water, improve the home, and keep his or her children and the environment clean. One of the Principles states, "We will not defecate in the open. We will use pit latrines."

Bo Kage Carlson

The Grameen Bank makes a point of turning to women as potential borrowers.

To help members fulfill this promise, the Bank makes housing improvement loans, including funds for purchasing a concrete latrine slab and three or more concrete rings. "Through the Grameen Bank, we are trying to get people toilet-minded," says Muhammad Yunus, who founded the Bank 13 years ago with a few hundred dollars of his own money. "We think of credit as a human right and not as a privilege for a fortunate few. Lending money to build simple latrines fits directly into the human side of the equation."

The typical individual loan from the Bank is about $67. To date, some $22 million has been lent for home improvements, and more than 100,000 latrines have been financed. A subsidiary loan programme has also been developed through which a latrine can be purchased with a $14 loan repayable over a one-year period.

"Improved sanitation has to start with women at the household level in Bangladesh," says Jannat E. Quanine, director of Grameen Bank's sanitation activities. "By providing credit directly to women and education through informal training, we are building social development alongside economic development."

Dr. Yunus explained it in human terms. "A village woman came up and hugged me a few days ago saying that before she got her loan, she would wait all day in the house in order to relieve herself after dark. Her new latrine has spared her from that torture."—**D.K.**

David Kirby / World Bank

tation Program in Dhaka, one of the driving forces in low-cost technology development. "Fresh groundwater has been available at relatively shallow depths throughout most of the country, making low-cost handpumps a viable solution. But making sanitation accessible, affordable and acceptable to the rural poor remains a major problem."

Handpumps have been in use for more than 100 years in Bangladesh. Beginning at the time of independence in 1971, concerted efforts were made to increase the number of tubewells using handpumps. Between 1971 and 1990, the number of public tubewells nearly quadrupled to almost 800,000 due to the efforts of the government, UNICEF and other international and local development agencies. The first handpumps used a cast-iron design. Subsequently the Tara, made largely from PVC plastic, became popular. Rural water supply coverage reached an impressive 59 per cent by 1990, which was far better than the 38 per cent coverage in urban areas. Recent surveys show that somewhere between 80 and 90 per cent of the public wells are functioning at any given time.

Despite ongoing efforts by the government and the aid community, sanitation facilities in rural Bangladesh remain severely deficient—perhaps explaining the widespread persistence of water-borne diseases and alarming rates of infant mortality (122 per 1,000 live births). As recently as 1988, only four people out of 100 in rural areas used a sanitary form of waste disposal. Most de-

Work continues on new handpump designs at the Mirpur Agricultural Workshop and Training School.

Photos by David Kinley / World Bank

Fresh water from Mirzapur's Tara handpumps is used for drinking and washing.

fecated in the open or used crude pit latrines.

Pilot projects to demonstrate and promote simple pour-flush latrines have been beset with problems. Beginning in the 1970s, the government tried distributing concrete latrine slabs free, but most of the newly built facilities were short-lived and fell into disuse. Next, UNICEF began selling slabs at a subsidized price. This campaign had limited success. Acceptance was gained mainly among the more literate, better-off sections of the rural community. Since then the government and UNICEF have set up centres throughout the country to produce the components of a pour-flush, water seal single pit latrine—five concrete rings and a latrine slab. These components are sold at a subsidized price of about $7. Projects to demonstrate twin-pit design latrines have met with very limited success in poorer villages. With construction alone costing more than $60, this design has simply proven too expensive for the majority of the poor.

Building on what has been learned at Mirzapur, and through other successful pilot projects, the government, together with UNICEF, the Swiss Development Corporation and the Danish International Development Agency, recently launched a nationwide campaign to help build demand for low-cost sanitation through mass education. This effort will complement new rural water and sanitation projects backed by financial and technical assistance from the World Bank, the UNDP-World Bank Water and Sanitation Program, the

World Health Organization and bilateral agencies. These projects are promoting greater involvement of the private sector in both manufacturing and marketing low-cost sanitation materials.

Alongside the rural sanitation challenge, Bangladesh is faced with growing problems of water table depletion and salt water intrusion, especially during the dry season when large volumes of groundwater are pumped out for irrigation.

"In 1985, less than eight per cent of the public handpumps in rural areas became non-functional during the May-June dry season," says Abu Jafar Shamshuddin, a water specialist working with the UNDP-World Bank Water and Sanitation Program in Dhaka. "In 1990, the portion of non-working pumps had risen to 15 per cent, and by the year 2000 it could reach as high as 50 per cent."

Foreseeing this danger, the government together with the donor community has embarked upon a large-scale effort to replace the shallow suction pumps with the Tara, which reaches deeper into the water table. This has meant rapidly boosting production and installation of Tara pumps. "Almost 20,000 new Taras are being installed across the country each year," says M. Hanisur Rahman, of the Mirpur Agricultural Workshop and Training School (MAWTS), the non-profit institute where the Tara design was initially developed and tested. "Now there are several private firms competing for procurement bids, and production should approach 50,000 annually by 1995."

New research is also under way at MAWTS to test further variations on the basic Tara design that would allow it to tap water at even greater depths. Components of the lever-action Afridev design, developed in East Africa, are also being matched with the Tara to come up with a new hybrid that is cost-effective, easy to maintain and able to deliver water throughout the dry season.

With its extreme poverty, poor sanitation conditions, and rapid population growth, Bangladesh is up against tough odds in improving rural living conditions. Moreover, rapid urbanization is accelerating the deterioration of conditions in the major cities and towns. But through close donor agency collaboration, concerted educational efforts at the grass roots, and greater reliance on private sector initiatives, the country has progressed in adopting sustainable rural water services. Now the lessons learned in Mirzapur and other successful experiments must be adapted to providing rural sanitation, and to improving services in Bangladesh's increasingly congested towns and cities. ■

Curt Carnemark

Many Bangladeshis rely on contaminated surface water for washing and for drinking.

Collaboration:

By Ranjith Wirasinha

Ranjith Wirasinha

Water is the source of life. It is also a finite resource. With less than one per cent of the earth's water available for drinking and irrigation, the competition for this resource is increasingly fierce. Thus a balance must be struck between satisfying the current and future water needs of people, agriculture, industry and livestock, and managing, conserving and protecting overall water resources in a sustainable manner.

There should be enough water for all if we manage it well. Two key factors in achieving this are improved collaboration among water sector practitioners at global, regional, national and local levels, and greater involvement of local communities, grass-roots organizations and non-governmental organizations (NGOs) in water management. Collaboration can accelerate the sharing of experience, knowledge, new ideas and information among sector planners and practitioners.

Much was accomplished during the International Drinking Water Supply and Sanitation Decade. A 1989 report commissioned by the United States Agency for International Development states that, as the Decade evolved, agencies involved found an effective means of collaborating and coordinating their efforts.

Despite such collaboration, a total of 1.2 billion people still remain without access to potable water. Another 1.7 billion have no sanitary means of disposing of human waste. One in three children is malnourished. Water and hygiene-related diseases kill 500 children every hour, every day. Whatever water is available is becoming increasingly scarce, and increasingly polluted.

How do we promote alliances between the different water users so that there is enough for all? One way is by preparing a national plan, often called a Sector Strategy and Action Plan. This can effectively rally all the water specialists to work together at country level. In doing so, the sovereignty of national governments will be respected and they will decide on priority areas. Then sector professionals, including those from external support agencies and NGOs, will work together with national water specialists to identify critical areas of work. Criteria adopted in crafting these plans include the feasibility of implementation and long-term sustainability.

Many developing country governments realize that without such collaboration there will be little hope of providing the services people require. Greater involvement by communities and local organizations is required. Citizens, too, must assume greater responsibility for delivering better services. And for collaboration to

The Wave of the Future

work, there must be the political will, strong policy and institutional support from national governments, which will become promoters as much as providers of water services.

Women too often are left out of decisions that affect them directly. Gender issues need to be placed higher up on the agenda. Women and children, the main caretakers of domestic water, should be encouraged to play influential roles in water management, hygiene education and sanitation services.

While there is a good deal of collaboration among donors, more can be done to share information and tackle operations and maintenance issues. Currently, almost 30 per cent of water and sanitation projects are working at less than full capacity five years after they are completed. We cannot afford this loss.

In the 1980s, nearly US$10 billion was invested yearly in water supply and sanitation in developing countries, with two thirds of the resources from developing countries themselves. It is estimated that nearly $50 billion a year would be needed to reach full coverage by the year 2000, using conventional technologies and approaches. The $50 billion a year target will be difficult to achieve because of already tight budgets. It will, therefore, be necessary to maximize the use of existing water and sanitation facilities and to increase their efficiency.

Greater success will come when there is effective collaboration within the sector. NGOs have a key role to play. So do multilateral agencies, communicators and academics. And of course, governments—of industrialized and developing countries alike.

The Water Supply and Sanitation Collaborative Council addresses this need for collaboration, information sharing and advocacy. Unlike United Nations agencies, which have a mandate given them by the UN General Assembly, the Council derives its mandate from its members. Even the funding is voluntary.

Council members are from developing countries and government, NGO and multilateral support agencies. They not only present the official viewpoint at meetings but also speak from personal expertise and knowledge. The collective wisdom of the participants is then presented by the Council to the member agencies for their consideration and support. This is vital.

In many ways, the Council is an organization for the 1990s—more network than structure, more partnerships than process, more tasking than talking and studies.

Collaboration is not easy. It takes time, talent, resources and persistence. It also requires pragmatism so that plans can be drawn up and adjusted based on the realities within countries. But collaboration is here to stay. It is the wave of the future for improved water and sanitation. ■

Ranjith Wirasinha is Executive Secretary of the Water Supply and Sanitation Collaborative Council. He was previously the Senior Project Engineer for Water Supply and Sanitation at the Asian Development Bank in the Philippines. Mr. Wirasinha assumed his new post in 1991. Inquiries about the Council should be directed to the Secretariat, c/o the World Health Organization, Avenue Appia 20, CH-1211, Geneva 27, Switzerland. Telephone: 41-22-791-3685 or Fascimile: 41-22-788-0054.

On the Right Road

Sweden's development assistance is aimed at promoting economic growth and social equality, economic and political independence, and democracy in developing countries. It also promotes sustainable use of natural resources and protection of the environment. In addition, Sweden strives to reduce the widening gap between developing and industrialized countries because it believes that such disparities increase tensions in the world and adversely affect all nations.

Sweden exceeds the UN's target of 0.7 per cent of GNP for Official Development Assistance (ODA). In 1989, its aid to developing countries amounted to US$1,809 million, or 0.98 per cent of its GNP. For the last five years, the country has ranked as UNDP's second largest donor after the United States. Its 1992 contribution of SEK 670 million ($111.7 million) makes Sweden UNDP's top donor this year.

While policy and budgetary responsibilities are handled almost exclusively by the Ministry of Foreign Affairs, bilateral implementation is conducted through a group of institutions. The Swedish International Development Authority (SIDA) handles nearly 50 per cent of Sweden's ODA.

Established in 1965, SIDA is involved in a wide range of activities in the areas of rural development, water and sanitation, humanitarian assistance and disaster relief, roadworks, education, environment, energy and telecommunications.

Every year, SIDA devotes nearly $33 million to water and sanitation projects. The main focus of its Water Supply Programme is on rural areas and the primary objective is to reduce the physical burden of fetching water,

Photo by Charlotte Thege Ricaut

SIDA's Water Supply Programmes emphasize sustainability, affordability and replicability.

to Development

especially for women and children. Long term goals are to build the capacities of developing countries to solve their problems relating to inadequate water supply and sanitation, and to improve community health and bring about social development.

SIDA currently supports water development programmes in Botswana, Central America, Ethiopia, India, Kenya, Tanzania, Uganda and Zimbabwe.

In the last 10 years, SIDA has changed the emphasis of its water programmes, from the construction of new water schemes to the improvement and strengthening of existing facilities. It insists on community participation in the implementation of its activities.

Results arising from this shift in emphasis show that SIDA is on the right road to sustainable development. Since 1988, for example, nearly 600,000 people in Botswana gained access to improved water supply. More than a million people in Ethiopia have been served with clean water. Nearly 200 million inhabitants in India are drawing water from durable handpumps. More than 400,000 rural folk in 156 villages in Tanzania now have clean water.

An important principle underlying SIDA's approach to assistance is that the recipient country must assume a major share of the responsibility for the project. SIDA provides money and expertise. "The ultimate goal of our assistance is development that will continue on its own," says Carl Tham, SIDA's director-general.

To enable the full participation of men and women in villages, SIDA shapes programmes according to the needs of the people. It also ensures that technologies are adapted to the social, economic and physical environment.

SIDA recognizes, as do many development organizations, that traditionally women play a key role in domestic water collection and use in developing countries. The agency attempts to involve women in all aspects of programmes. In India and Kenya, for example, special efforts have been made to train women in the repair and maintenance of handpumps. In Zimbabwe, women play a prominent role in the construction of latrines and wells. In Ethiopia, women are being trained as engineers.

In all its programmes, SIDA emphasizes training, transfer of knowledge and learning of new skills. Workshops and seminars are designed to make communities aware of how they can benefit from the programme. In Botswana and Zimbabwe, trials are being conducted using photovoltaic pumping systems.

Ever increasing attention is being focused on broader issues of water and the environment because of their impact on the health and well-being of people. Inadequate water supply and sanitation cause nearly 80 per cent of all the world's sickness and between 10 and 25 million deaths every year. A study is under way, focusing on sanitation in urban areas, while new guidelines on environmental hygiene are being drawn up.

SIDA is also helping improve water supply and environmental sanitation in marginal urban areas. The rapid expansion of towns and cities and the resulting water and sanitation problems will, in future, demand more attention.

Looking ahead, SIDA's programmes will continue to emphasize sustainability, affordability and replicability. More thought will be given to the environmental aspects of development to minimize negative ecological consequences when implementing water projects in fragile areas. There will be greater emphasis on the management of water resources. And much research and development into appropriate technologies affordable to poor urban households will be supported. **—I. Rajeswary**

Dublin Conference Agrees on Water as an Economic Good

By I. Rajeswary

Dublin, Ireland—The question of treating water as an economic good and thus charging for it sparked one of the liveliest debates at the six-day International Conference on Water and the Environment in January. Proponents of pricing said that past failure to recognize the economic value of water had led to wasteful and environmentally damaging use of this scarce resource. They also felt that anything that was acquired free of charge was seen to have no value. If priced properly, people would treat it as a precious commodity.

Opponents, particularly those from developing countries, said pricing would be carried out at the expense of the poor, especially women who are the bearers of water for domestic use in many parts of the developing world.

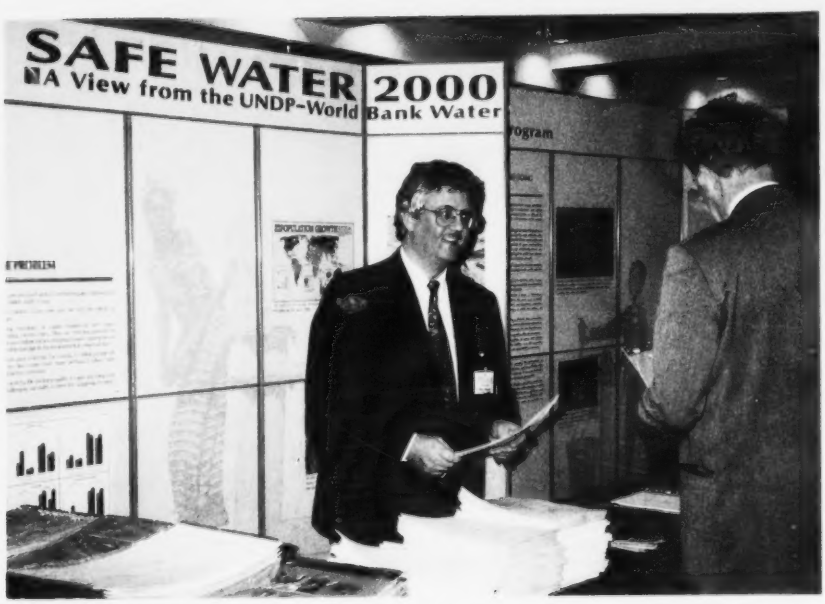
The conference was hosted by the Government of Ireland and convened by the World Meteorological Organization on behalf of more than 20 UN organizations and agencies working on freshwater-related issues. It was opened by the then Prime Minister of Ireland, Charles Haughey. It was attended by 500 experts, including representatives from 113 developing and industrialized countries, 24 organizations of the United Nations system, 18 intergovernmental organizations and 37 non-governmental organizations.

The debate over pricing continued inside and outside meeting rooms, along corridors and at coffee-tables groups of people huddled in deep discussion over cups of coffee in a haze of cigarette smoke.

Papers presented at the conference revealed that the misuse of fresh water throughout the world continues to pose a threat to sustainable development and environmental protection. It was pointed out that water is a scarce commodity and fresh water resources are dwindling—that without timely action, the world stands to face a major water crisis.

In the end, participants had to acknowledge the grim realities. They endorsed the principle that water should be treated as an economic good. But they also recognized that access to clean water and sanitation is a basic human right, and that services should be available at an affordable price. This imperative became part of *The Dublin Statement on Water and Sustainable Development*, which was released at the close of the gathering.

The main focus of the conference was the development, management and utilization of water resources in harmony with the environment. Eleven keynote papers were presented and the



I. Rajeswary / UNDP

Promoting the importance of safe water at the Dublin Conference.

work of the conference proceeded in six working groups. The outcome was *The Dublin Statement*, which was submitted to the UN Conference on Environment and Development held in Rio de Janeiro in June.

The Dublin Statement contains four guiding principles:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels;
- Women play a central part in the provision, management and safe guarding of water; and
- Water has an economic value in all its competing uses and should be recognized as an economic good.

Based on these principles, the conference developed recommendations to enable countries to tackle water resources problems on several fronts. They centred around alleviation of poverty and disease, water conservation and reuse, and resolution of water conflicts.

In closing the conference, Dr. Rory O'Hanlon, Ireland's Minister for the Environment, said: "Water management is essential above all to sustaining human development; if the environmental requirements of water are not respected, then even human health and human subsistence are imperiled."

Deepa Narayan-Parker

PROWWESS Relocates

Washington, DC—In March 1992, UNDP's Promotion of the Role of Women in Water and Environmental Sanitation Services (PROWWESS) moved to Washington DC. Ms. Deepa Narayan-Parker, a developmental psychologist, has taken over as PROWWESS Manager from Ms. Siri Melchior-Tellier, who has returned to her native country of Denmark as Director of the International Division of the Danish Red Cross. Ms. Narayan-Parker joined PROWWESS in 1988 as the Senior Planning and Evaluation Officer. PROWWESS is now part of the UNDP-World Bank Water and Sanitation Program and is housed in the World Bank. Please address all queries, including requests for PROWWESS publications to:

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Fund to Promote Innovative Low-Cost Technologies

New York, NY—The UNDP-World Bank Water and Sanitation Program, UNDP and UNICEF have launched a fund to provide seed money for the development of new or improved water and sanitation technologies in developing countries, which can help reduce the cost of extending water and sanitation services for the poor.

The Technology Promotion Facility, with an initial budget of US$125,000, will award small grants of up to $25,000 to inventors or manufacturers for the testing of low-cost, innovative technologies that can be produced locally.

It is hoped that the fund will encourage the application and field testing of new technologies and promote local manufacturing capabilities. One of the first projects to benefit from the fund will produce reliable, low-cost water cisterns, latrine slabs and other products.

With a grant of $25,000, the Lifesource Water Cistern project started in August 1991 with a reconnaisance visit to Guatemala, Honduras and El Salvador by Lifesource Corporation, a firm of US-based engineers. They plan to apply *Inflatable Mold Technology*, which uses inflatable vinyl forms to mould reinforced materials like fibre glass and has been used in the construction of boats. This technology will be adapted to enable the use of natural fibres found in Central America like maguey and jute, as well as water-soluble powdered resins.

Use of local materials and production facilities is expected to reduce the production costs of cisterns by up to 50 per cent, and the time it takes to manufacture them by as much as 40 per cent.

According to Jan Dorfman, who co-designed the technology, a 6,000-litre water cistern made from local fibres should cost $200. The fibre cisterns will have the added advantage of being much lighter and possibly more durable than traditional cement tanks.

Future applications of the technology will include latrine components and garbage bins.

For further information on the Technology Promotion Facility, please contact:

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Correction:

In the December 1991 issue of *Source*, a photograph on Page 24 accompanying an article on duckweed cultivation was captioned incorrectly. The caption should read: "Plan of the Lemna Corporation's duckweed based wastewater treatment system in Devil's Lake, North Dakota, USA."

GLOBAL APPLIED RESEARCH NETWORK (GARNET)

Launched in March 1991 with funding from the USAID-funded WASH Project, GARNET is a collaborative initiative helping to facilitate the exchange of information on applied research in the water and sanitation sector around the world. Its purpose is to establish and support an informal, decentralized network of organizations that can exchange information and ideas on applied research on a timely and efficient basis. Networks for information exchange are being established topically and regionally under the joint global co-ordination of the WASH Project and the UNDP-World Bank Water and Sanitation Program.

Over the past year, 22 topic-specific research networks have been identified, while three organizations have become regional network coordinators for information exchange. Most of the current networks pertain to technological or "hardware" issues, but a special effort is under way to identify applied research networks focused on non-technological or "software" topics.

The GARNET initiative is promoting the role of developing country institutions as key centres for topical research. It is also demonstrating that a collaborative approach to research and information exchange can be effective through an informal, low-cost approach.

For further information, contact:

Craig Hafner
Deputy Project Director
WASH Project
1611 North Kent Street, Suite 1001
Arlington, VA 22209, USA
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FROM UNDP AND THE INTERNATIONAL INSTITUTE FOR HYDRAULIC AND ENVIRONMENTAL ENGINEERING

A STRATEGY FOR WATER SECTOR CAPACITY BUILDING
By G.J. Alaerts, T.L. Blair, and F.J.A. Hartvelt. 191 pages.
Available in English, French and Spanish
Available free of charge from:
United Nations Development Programme
Division for Global and Interregional Programmes
FF-12104, One United Nations Plaza
New York, NY 10017, USA

This book contains selected papers and proceedings from the UNDP-sponsored symposium, "A Strategy for Water Resources Capacity Building," held in Delft, The Netherlands in June 1991. Part I describes the UNDP symposium and includes the "Delft Declaration" emerging from the meeting. Part II contains two detailed background documents on water sector capacity building. Part III presents key issues in capacity building from the perspective of countries, institutes and external support agencies. Presentations are from Sri Lanka and Ethiopia, the World Bank, the Food and Agriculture Organization and the World Meteorological Organization.

FROM UNDP

WATER, GARDENS AND HEALTH: A GUIDE FOR COMMUNITY EDUCATORS
By Stephen Minkin (Test Edition) 1991, 60 pages.
Available free of charge from:
United Nations Development Programme
Division for Global and Interregional Programmes
FF-12104
One United Nations Plaza
New York, NY 10017, USA

This manual is rich in information and experiences related to water and sanitation, health and nutrition and the environment. The writer employs simple dialogue, messages and illustrations. Water, sanitation and health issues are presented in an uncomplicated manner, making the book accessible to people with a broad range of backgrounds and levels of literacy. School teachers can use it to involve students in promoting personal hygiene. Community workers can use it to promote group activities for improved health and environment.

FROM THE UNDP-WORLD BANK WATER AND SANITATION PROGRAM

THE DEVELOPMENT OF WATER SUPPLY ASSOCIATIONS IN FINLAND AND ITS SIGNIFICANCE FOR DEVELOPING COUNTRIES
By Tapio S. Katko. Water and Sanitation Discussion Paper Series Number 8
February 1992, 58 pages
Available free of charge from:
UNDP-World Bank Water and Sanitation Program
The World Bank
1818 H Street, NW
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Can the development experiences of more advanced European countries serve as a guide for developing countries?

This discussion paper traces the development of rural water supply organizations in Finland over the last century to demonstrate that certain basic principles are applicable anywhere in the world. It concludes that development of the water supply sector depends on private initiative and should be based upon consumer demand. According to the study, "Government should concentrate on policy, guidance and promotion of consumer-managed associations for rural water supply so that consumers can select the service levels they prefer and are willing to pay for."

FROM THE IRC INTERNATIONAL WATER AND SANITATION CENTRE

JUST STIR GENTLY—THE WAY TO MIX HYGIENE EDUCATION WITH WATER SUPPLY AND SANITATION
By Marieke T. Boot.
Technical Paper Series No. 29., 1991, 181 pages. Price: US$34
Available from:
IRC International Water and Sanitation Centre
P. O. Box 93190
2509 AD The Hague,
The Netherlands

This book provides methods for integrating hygiene education with water supply and sanitation projects. It covers topics including the process of behavioural change, hygiene education planning, programme organization and costs. The publication is intended primarily for those involved in the development and implementation of hygiene education components in water supply and sanitation projects. In the illustrations, frogs stand in for human beings.

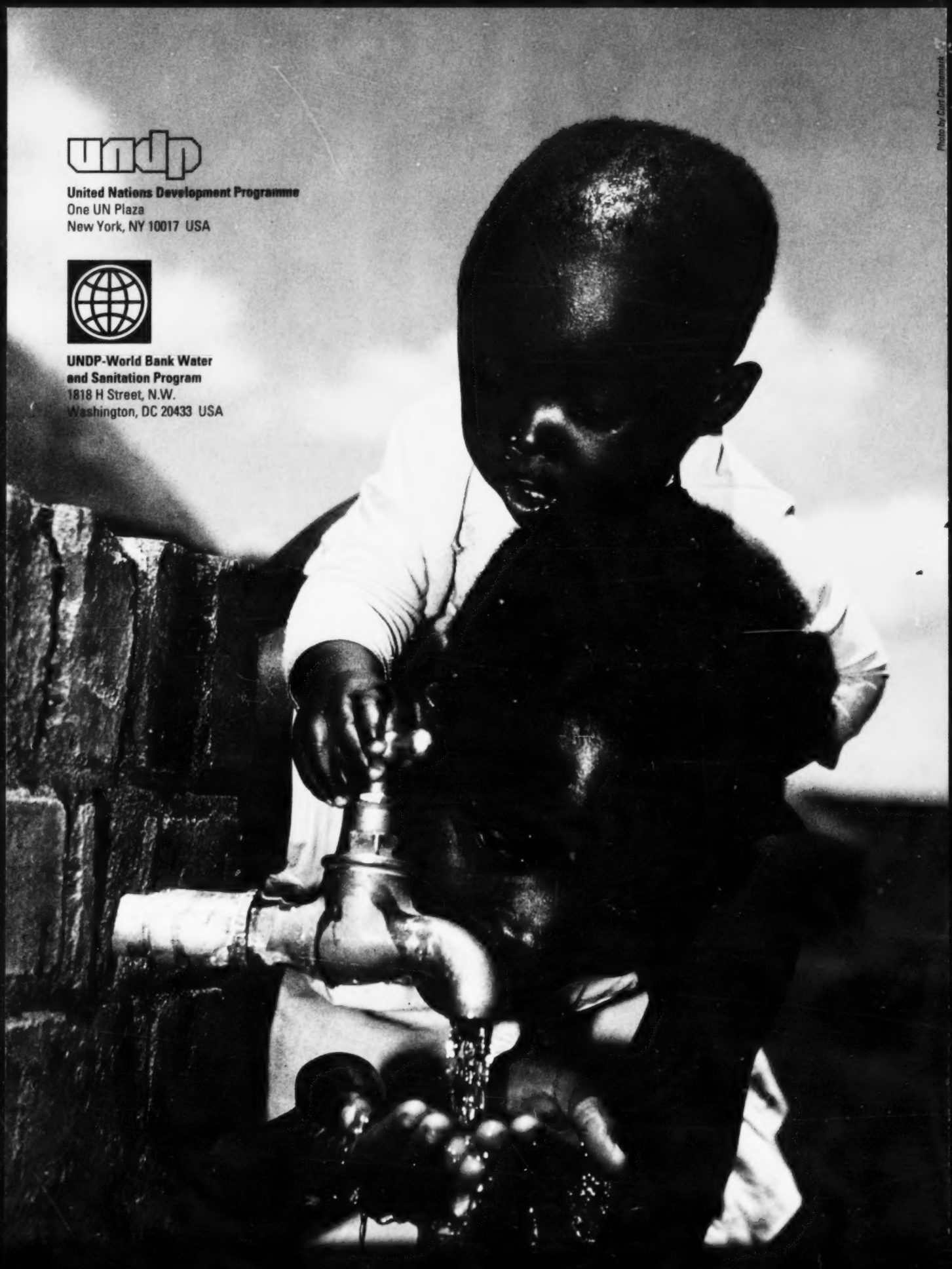

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Photo by Curt Carnemark

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